THE COMBINED EFFECT OF MOISTURE AND GROWTH REGULATORS ON WHEAT

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THESIS

Submitted to the Graduate Division in Partial Fulfilment
of the Requirements for the Degree of

MASTER OF AGRICULTURE SCIENCE
(SOILS)

Faculty of Agriculture
Ain Shams University

1971

APPROVAL SHEET

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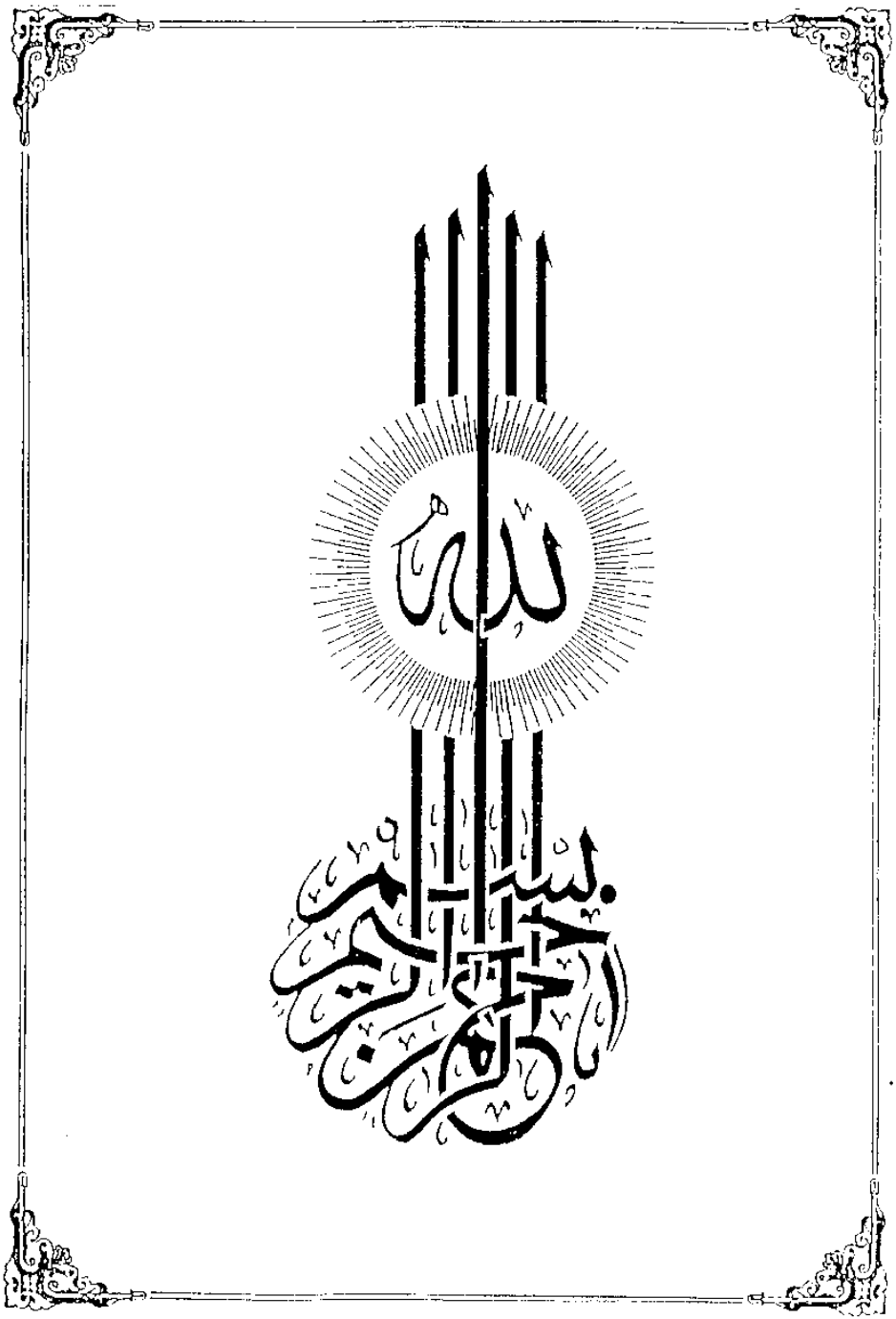

A C K N O W L E D G E M E N T

The writer feels deeply indebted to Prof. Dr. M.A. Omar, Head of the Soils Department, Faculty of Agriculture, El-Azhar University, who had rendered helpful assistance in the designing and in the preparation of this thesis.

Thanks are also due to Associate Prof. Dr. A. Said, and Dr. A. Sallam, Lecturers, in the Soils Department, Faculty of Agriculture, Ain-Shams University, for their constructive suggestions during work.

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1. INTRODUCTION

Wheat is one of the cereal crops in U.A.R., it is considered as the first nutritional crop. At the same time, it is found that there is a shortage in the quantity of this crop for the local consumption. To give an idea about this shortage in this crop it is enough to know that only 1.4 million tons were produced in 1966 and 2.48 million tons were imported to balance the local consumption which was about 3.95 million tons. The area cultivated in 1968 is about 1.4 million feddan.

So many efforts must be done by all the scientistes dealing with the agricultural problems to improve the quality as well as the quantity produced by the soil unit area of the soil.

There are many factors that affect the production and the quality of the different crops. As a matter of fact, soil moisture is one of the most important factors, affecting plant growth. The quantity of available water may play its role on both vegetative growth and crop yields.

Recently, investigations revealed that the growth regulators have their effects on yields specially its highly

practical importance for preventing lodging of cereals and consequently higher yields could be obtained.

In addition, it is well known that the time of application of nitrogen fertilizers has its great effect on the yield of the crops. So, it will be more useful to take this factor into consideration when studying problems related to crop production.

The aim of this study is to trace the effect of the soil moisture as levels of available moisture and the growth regulator on both quality and quantity of wheat yield, taking into consideration the time of application of nitrogen fertilizer.

2. REVIEW OF LITERATURE

A brief review of the work done with regard to the effect of soil moisture, growth regulator (CCC) (2-chloro-ethyl-trimethyl ammonium chloride) as well as time of applying nitrogen fertilizer upon wheat crop, and their interaction is presented on the following pages. For the sake of convenience the subject will be reviewed under three separate headings namely :

1- Soil moisture in relation to growth and yield .
2- Effect of time of nitrogen application on yield of wheat and quality of grain.
3- Effect of CCC on yield of wheat and quality of grain.

2.1. Soil moisture in relation to growth and yield :

It is obviously settled that the soil moisture is one of the important factors affecting plant growth when dealing with such factor, the available water and its effect on plant growth and also on the quality of the grain as well as the consumptive use will be the two items of this part.

The available moisture as defined by Kramer (1949) is the moisture that can be used by plants in growth and

t ... re the moisture above the permanent-wilting ...ercentage, or first permanent wilting point - while gravitational water is readily available to plants, it usually drains off too soon to be of much importance. The readily available water, therefore, is usually considered to be that included in the range from field ...acity down to the permanent-wilting percentage.

...eckett and Robertson (1917), Marr et al. (1927), and Oppenheimer and Elze (1941) indicated that plants respond favourably to relatively high soil moisture conditions. They also concluded that plant growth diminishes progressively as the soil moisture content falls below field capacity and ceases at the permanent wilting percentage.

On the other hand, Veihmeyer and Hendrickson (1950) stated that plants can obtain a supply of water with equal facility between field capacity and the permanent wilting percentage. Their view was, that rate of growth is not diminished over the available range or, in other words that no measurable increase in rate of growth are obtained by irrigating until the soil moisture falls to near the permanent wilting percentage.

Hagan (1957) presented that plant growth is a function of soil moisture stress. He indicated that growth is not affected in many soils when the soil moisture level falls to permanent wilting percentage. But, the growth decreased in many soils when soil moisture level falls to about 50 % of the available moisture.

The soil water or in other words the available water will affect greatly both the growth and the yield of the different crops. Widstoe (1913) indicated that if wheat crop grown under moderately dry conditions, is irrigated, increasing the amount of the irrigation water will increase the amount of leaf, and hence the straw yield would be increase much more than the grain. Legett and Nelson (1960) indicated that the low supply of available soil moisture resulted in lowering wheat yields obtained.

Jackowska (1961) found that, decrease of soil moisture to 20 % of total water capacity even for a short time impaired development and reduced grain yields and (1000 grain weight). Increase of soil moisture to 85 % of total water capacity for short duration did not affect grain yields. Straw yields increased with increasing moisture and decreased with decreasing moisture, only